UNDERGRADUATE DEGREE
COURSES IN

COMPUTER SCIENCE
&
ENGINEERING

(Engineering &Technology)

[Syllabus – 2023 onwards]

Department of Computer Science & Engineering
Dibrugarh University Institute of Engineering and Technology, Dibrugarh University
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All India Council for Technical Education
Model curriculum for
Undergraduate Degree Courses in Engineering & Technology

COMPUTER SCIENCE AND ENGINEERING

CONTENTS

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COMPUTER SCIENCE AND ENGINEERING

Chapter -1
General, Course structure & Theme
&
Semester-wise credit distribution

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week 2 Hours Practical(Lab)/week	0.5credit 1 credit

B. Range of credits-A student will be eligible to get Graduate degree in Engineering, if he/she completes 168 credits. A student will be eligible to get Under Graduate degree with Honours, if he/she completes an additional 20 credits. These could be acquired through MOOCs.

C. Structure of Undergraduate Engineering program:

Sl. No.	Category	Credit Breakup for CSE Students
1	Humanities and Social Sciences including Management courses	13
2	Basic Science courses	22
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	23
4	Professional core courses	59
5	Professional Elective courses relevant to chosen specialization/branch	12
6	Open subjects – Electives from other technical and /or emerging subjects	9
7	Project work, seminar and internship in industry or elsewhere	21
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution]	2
9	Skill based Course	12
10	Audit Course	(non-credit)
	Total	**173**

**Minor variation is allowed as per need of the respective disciplines.*

D. Credit distribution in the First year of Undergraduate Engineering program:

	Lecture	Tutorial	Laboratory/Practical	Total credits
Chemistry	3	0	2	4
Physics-I	3	1	2	5
Maths-I	3	0	0	3
Maths-II	3	1	0	4
Programming for Problem solving	2	0	4	4
English	2	0	2	3
Engineering Graphics & Design	1	0	4	3
Workshop/ Practical	1	0	4	3
Basic Electrical Engg.	2	0	2	3
*Maths-III	3	0	0	3

These courses may be offered preferably in the later semesters

E. Course code and definition:

Course code	Definitions
BS / BSC	Basic Science Courses
ES/ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management courses
CSE	Professional core courses
CSE-ELV	Professional Elective courses
CSE-O-ELV	Open Elective courses
MC	Mandatory courses
SBC	Skill Based Course
AU	Audit Course

HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	HSMC 101	English for Technical Writing	2	0	2	3	1
2	HSMC 201	Universal Human Value - I	2	0	0	2	2
3	HSMC 401	Humanities-I	3	0	0	3	4
4	HSMC 402	Humanities-II	0	0	4	2	4
5	HSMC 501	Humanities-III	3	0	0	3	5
Total Credits:						**13**	

BASIC SCIENCE COURSE [BSC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	BS 101	Mathematics-I	3	0	0	3	1
2	BS 102	Biology for Engineers	3	0	0	3	1
3	BS 201	Mathematics-II	3	1	0	4	2
4	BS 202	Physics-I	3	1	2	5	2
5	BS 203	Chemistry	3	0	2	4	2
6	BSC 301	Mathematics-III (Transform Calculus)	3	0	0	3	3
Total Credits:						**22**	

SKILL BASED COURSE [SBC]

Sl. No.	Code No.	Course Title	Hours Per Week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	SBC 101	Data Analysis in Sci-Lab and Excel	1	0	4	3	1
2	SBC 102	MS-Office and MS Project Management	1	0	4	3	2
3	SBC 102	Data Analytics	1	0	2	3	3
4	SBC 401	Robotics	1	0	2	3	4
Total Credits:						**12**	

ENGINEERING SCIENCE COURSE [ESC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	ES 101	Basic Electrical Engineering	2	0	2	3	1
2	ES 102	Engineering Graphics & Design	1	0	4	3	1
3	ES 103	Basic Engineering Workshop	0	0	4	2	1
4	ES 201	Programming for Problem Solving	2	0	4	4	2
5	ES 202	Digital Fabrication/Workshop/ Manufacturing Practices Lab	0	0	4	2	2
6	ES 203	Digital Thinking	0	0	2	1	2
7	ESC 301	Digital Electronics	3	0	4	5	3
8	ESC 302	Signals and Systems	3	0	0	3	5
Total Credits:						**23**	

PROFESSIONAL CORE COURSES [PCC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-301	Principles of Programming Language	3	0	0	3	3
2	CSE-302	Data Structure & Algorithms	3	0	4	5	3
3	CSE-313	Software tools	0	0	4	2	3
4	CSE-401	Discrete Mathematics	3	1	0	4	4
5	CSE-402	Computer Organization and Architecture	3	0	4	5	4
6	CSE-403	Object OrientedProgramming	3	0	4	5	4
7	CSE-404	Database Management Systems	3	0	4	5	4
8	CSE-501	Design and Analysis of Algorithms	3	0	4	5	5
9	CSE-502	Computer Network	3	0	4	5	5
10	CSE-503	Formal Language & Automata Theory	3	0	4	5	5
11	CSE-504	Operating Systems	3	0	4	5	5

12	CSE-601	Compiler Design	3	0	4	5	6
13	CSE-602	Computer Network & Security	3	0	4	5	6
Total Credits:						**59**	

PROFESSIONAL ELECTIVE [PEC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-ELV-501	Elective - I	3	0	0	3	6
2	CSE-ELV-601	Elective - II	3	0	0	3	7
3	CSE-ELV-602	Elective - III	3	0	0	3	7
4	CSE-ELV-701	Elective - IV	3	0	0	3	8
Total Credits						**12**	

OPEN ELECTIVE COURSES [OEC]

Sl. No	Code No.	Course Title	Hours per week			Total Credits	Semester
			Lecture	Tutorial	Practical		
1	CSE-O-ELV-601	Open Elective – I	3	0	0	3	7
2	CSE-O-ELV-701	Open-Elective-II	3	0	0	3	8
3	CSE-O-ELV-801	Open-Elective-III	3	0	0	3	8
Total Credits:						**9**	

4 year Curriculum structure
Undergraduate Degree in Engineering & Technology

Branch / course: Computer Science and Engineering
Total credits (4 year course): 168

I. Induction Program (Please refer Appendix-A for guidelines)

Induction program (mandatory)	**3 weeks duration** (Please refer Appendix-A for guidelines & also details available in the curriculum of Mandatory courses)
Induction program for students to be offered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch &Innovations

II. Semester-wise structure of curriculum

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

Semester I (First year] Curriculum
Branch/Course: Computer Science Engineering

Mandatory Induction Programme (3 weeks duration)

Sl. No.	Type of course	Course Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Basic Science course	BS-101	Mathematics-I	3	0	0	3
2	Engineering Science Course	ES 101 (T)	Basic Electrical Engineering	2	0	0	2
3	Engineering Science Course	ES 101 (P)	Basic Electrical Engineering Lab	0	0	2	1
4	Engineering Science Course	ES 102	Engineering Graphics & Design	1	0	4	3
5	Humanities & Social Sciences including Management courses	HSMC 101 (T)	English for Technical Writing	2	0	0	2
6	Humanities & Social Sciences including Management courses	HSMC 101 (P)	English for Technical Writing Lab	0	0	2	1
7	Basic Science course	BS 102	Biology For Engineers	3	0	0	3
8	Engineering Science Course	ES 103	Basic Engineering Workshop	0	0	4	2
9	Skill Based Course (Any One)	SBC 101	Skill Based Course – I (Data Analysis in Sci-Lab and Excel)	1	0	4	3
			Total credits				**20**

Semester II (First year) Curriculum
Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Basic Science course	BS 201	Mathematics-II	3	1	0	4
2	Basic Science course	BS 202 (T)	Physics-I	3	1	0	4
3	Basic Science course	BS 202 (P)	Physics-I Lab	0	0	2	1
4	Basic Science course	BS 203 (T)	Chemistry	3	0	0	3
5	Basic Science course	BS 203 (P)	Chemistry Lab	0	0	2	1
6	Engineering Science Course	ES 201 (T)	Programming for Problem Solving	2	0	0	2
7	Engineering Science Course	ES 201 (P)	Programming for Problem Solving Lab	0	0	4	2
8	Engineering Science Course	ES 202	Digital Fabrication/ Workshop/ Manufacturing Practices Lab	0	0	4	2
9	Engineering Science Course	ES 203	Digital Thinking	0	0	2	1
10	Humanities & Social Sciences including Management courses	HSMC 201	Universal Human Value – I	2	0	0	2
11	Audit Course	AU 202	Sports and Yoga/ NSS/ NCC	2	0	2	0
12	Skill Based Course	SBC 201	Skill Based Course – II (MS-Office and MS Project Management)	1	0	4	3
			Total credits				**25**

Semester III (Second year] Curriculum
Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE 301	Principles of Programming Language	3	0	0	3
2	Professional Core Courses	CSE-302 (T)	Data structure & Algorithms	3	0	0	3
3	Professional Core Courses	CSE-302 (P)	Data structure & Algorithms	0	0	4	2
4	Engg. Science Course	ESC 301 (T)	Digital Electronics	3	0	0	3
5	Engg. Science Course	ESC 301 (P)	Digital Electronics	0	0	4	2
6	Professional Core Courses	CSE-313	Software tools	0	0	4	2
7	Basic Science course	BSC 301	Transform Calculus	3	0	0	3
8	Engineering Science Course	ESC 302	Signals & Systems	3	0	0	3
9	Skill Based Course	SBC 301	Data Analytics	1	0	2	3
10	Mandatory Course	MC 201	Indian Knowledge System	2	0	0	2
			Total credits				**26**

Semester IV (Second year] Curriculum
Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE-401	Discrete Mathematics	3	1	0	4
2	Professional Core Courses	CSE-402 (T)	Computer Organization & Architecture	3	0	0	3
3	Professional Core Courses	CSE-402 (P)	Computer Organization & Architecture	0	0	4	2
4	Professional Core Courses	CSE-403 (T)	Object Oriented Programming	3	0	0	3
5	Professional Core Courses	CSE-403 (P)	Object Oriented Programming Laboratory	0	0	4	2
5	Professional Core Courses	CSE 404 (T)	Database Management Systems	3	0	0	3
5	Professional Core Courses	CSE 404 (P)	Database Management Systems	0	0	4	2
6	Humanities & Social Sciences including Management courses	HSMC 401 (T)	Humanities-I (Managerial Economics)	3	0	0	3
7	Humanities & Social Sciences including Management courses	HSMC 402 (P)	Humanities-II (Technical English for Engineers)	0	0	4	2
8	Mandatory Course	MC 201	Environmental Science	0	0	0	0
9	Skill Based Course	SBC 401	Robotics	1	0	2	3
10	Project/seminar/ Internship, etc.	CSE - 415	Internship - I	0	0	3	3
			Total credits				**30**

Semester V (Third year] Curriculum
Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE-501 (T)	Design & Analysis of Algorithms	3	0	0	3
2	Professional Core Courses	CSE-501 (P)	Design & Analysis of Algorithms	0	0	4	2
3	Professional Core Courses	CSE-502 (T)	Computer Network	3	0	0	3
4	Professional Core Courses	CSE-502 (P)	Computer Network	0	0	4	2
5	Professional Core Courses	CSE-503 (T)	Formal Language & AutomataTheory	3	0	0	3
6	Professional Core Courses	CSE-503 (P)	Formal Language & AutomataTheory	0	0	4	2
7	Humanities &Social Sciences including Management courses	HSMC-501	Humanities-III (Management & Accountancy)	3	0	0	3
8	Professional Core Courses	CSE-504 (T)	Operating Systems	3	0	0	3
9	Professional Core Courses	CSE-504 (P)	Operating Systems	0	0	4	2
10	Audit Course	AU 501	Professional Ethics	-	-	-	0
Total credits							**23**

Semester VI (Third year] Curriculum
Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Core Courses	CSE-601 (T)	Compiler Design	3	0	0	3
2	Professional Core Courses	CSE-601 (P)	Compiler Design	0	0	4	2
3	Professional Core Courses	CSE-602 (T)	Computer Network & Security	3	0	0	3
4	Professional Core Courses	CSE-602 (P)	Computer Network & Security	0	0	4	2
5	Professional Elective courses	CSE-ELV-601	Elective-I	3	0	0	3
6	Project/seminar/ Internship, etc.	CSE - 613	Internship - II	0	0	4	4
			Total credits				**17**

Semester VII (Fourth year] Curriculum
Branch/Course: Computer Science Engineering

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Elective courses	CSE-ELV-701	Elective-II	3	0	0	3
2	Professional Elective courses	CSE-ELV-702	Elective-III	3	0	0	3
3	Open Elective courses	CSE-O-ELV-701	Open Elective-I	3	0	0	3
4	Project/seminar/ Internship, etc.	CSE- 711	Internship-III	0	0	4	4
5	Project	CSE-712	Project-I	0	0	8	4
			Total credits				**17**

Semester VIII (Fourth year] Curriculum
Branch/Course: Computer Science Engineering
[Summer Industry Internship]

Sl. No.	Type of course	Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
1	Professional Elective courses	CSE-ELV-801	Elective-IV	3	0	0	3
2	Open Elective courses	CSE-ELV-O-802	Open Elective-II	3	0	0	3
3	Open Elective courses	CSE-O-ELV-801	Open Elective-III	3	0	0	3
4	Project	CSE-811	Project-II	0	0	8	4
5	Project/seminar/ Internship, etc.	CSE-812	Grand-VIVA	0	0	2	2
			Total credits				**15**

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